Financing and investment trends

The European wind industry in 2018

WindEurope

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This report summarises financing activity in the European wind sector from 1 January 2018 to 31 December 2018.
Unless stated otherwise this includes the 28 EU Member States and the following countries: Montenegro, Norway, Russia, Serbia, Turkey and Ukraine.

It includes investment figures for the construction of new wind farms, refinancing transactions for wind farms under construction or operation, project acquisition activity, company acquisitions and capital market financing. Rounding of figures is at the discretion of the author.

Non-recourse finance figures pre-2017 have been restated from previous publications.

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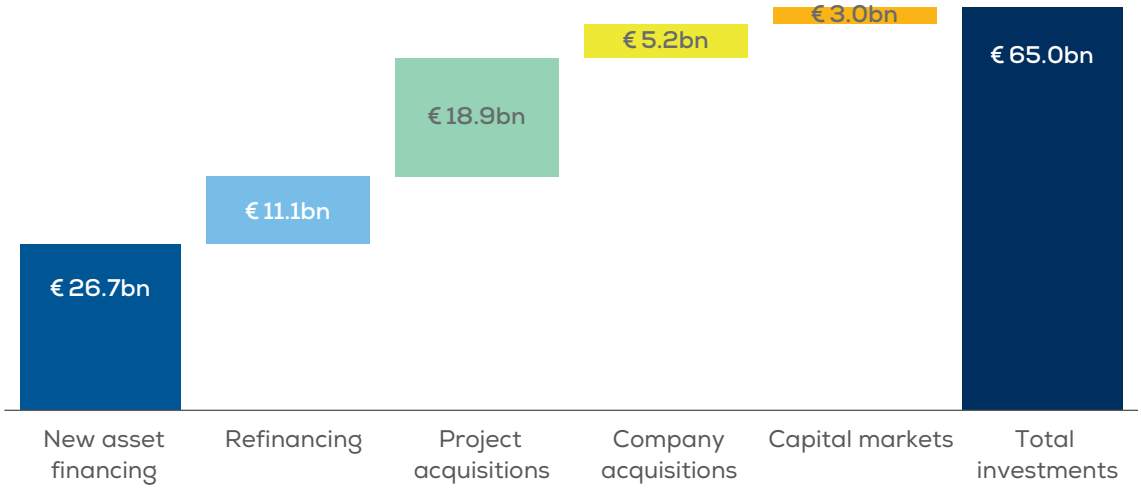
EXECUTIVE SUMMARY

In 2018 the wind energy industry invested €65bn in Europe. This included investments in new assets, refinancing transactions, mergers and acquisitions at project and corporate level, public market transactions and raised private equity.

Wind energy represented the largest investment opportunity in the power sector, accounting for over 60% of all investments in new power capacity in Europe in 2018. The technology is seen by governments and policy makers as a major driver to transition from fossil fuels and conventional power assets. Cost-competitiveness and reduced risk perceptions have attracted domestic and international market players looking to diversify their portfolios and/or align with their sustainability targets.

Wind energy projects make an attractive investment and there is plenty of capital available to finance them. If a wind energy project can meet the requirements of lenders, it will be financed. The challenge for investors is finding those viable projects which have their desired risk and return profile.

FIGURE 1
European wind energy investments in 2018 per asset class (€bn)



Source: WindEurope

2018 annual figures

- Europe raised a record total of €65bn for the construction of new wind farms, refinancing operations, project and company acquisitions as well as public market fundraising.
- Less than half of this, €26.7bn, was investments in new wind farms. However, due to cost reductions in new project financing, 2018 was a record year for new capacity financed (16.7 GW). 12.5 GW of new capacity was financed for onshore projects and 4.2 GW for offshore.
- Investment in new onshore wind projects was a record €16.4bn, 38% of the total new power investments in Europe. Investment in new offshore wind farms totalled €10.3bn (24% of total new power investments).
- Project acquisitions, where investors purchase (a share of) a wind energy project whether in operation or under development, doubled in value in 2018 to €18.9bn, from €9bn in 2017. These were the main drivers of growth in wind energy investments.
- Banks extended a record €26.9bn in non-recourse debt for the construction and refinancing of wind farms.
- Wind energy was the largest investment opportunity in the power sector in Europe.

Country highlights

- Investment flows in 2018 were less geographically concentrated than 2017, with 22 countries announcing Final Investment Decisions (FIDs) compared to 20 countries in 2017 and 16 in 2016.
- Northern and Western Europe still hold the biggest bulk of new investments. The UK and Sweden account for 35% of the new FIDs announced in 2018.
- Investments in South East Europe (SEE) remain low. With a total of €1bn, the SEE region represents only 4% of the total new assets financed in Europe, down from 16% in 2017.
- In the UK, the Moray East (950 MW) and Triton Knoll (860 MW) offshore wind farms reached FID. In the Netherlands, Borssele III and IV Offshore Wind Farms (731.5 MW) reached FID.
- The largest onshore wind farm to reach FID in 2018 was Nysater in Sweden, with a capacity of 475 MW.

Investment trends

- The low interest rate environment, plus a large number of lenders looking to invest, continues to provide favourable conditions to drive the take up of new debt and the refinancing of existing debt.
- Capital for new assets is being raised with more debt than ever before. Projects raised 90% of their capital with debt in 2018 (on a project finance basis).
- 2018 was a record year for refinancing with €11bn of activity, driven by 4 large offshore wind farms refinancing their debts on completion of the construction phase.
- New investments in offshore wind in 2018 were dominated by project finance transactions. This differs from previous years where offshore financing was dominated by balance sheet transactions (corporate finance).
- Banks are more comfortable with the risks associated with the offshore market facilitating the take up of new offshore projects on a project finance or non-recourse basis.

Investment Outlook

- Investment volumes in new wind energy projects are expected to increase overall in 2019. This will be driven by onshore wind projects which have already been awarded public financial support and are expected to reach FID this year. Offshore wind investments are expected to be similar to 2018 levels.
- Strong equity and debt liquidity is expected to continue for both onshore and offshore wind projects.
- In the near term, interest rates are expected to remain low, even after quantitative easing came to an end in 2018. The European Central Bank will not be introducing an interest rate hike until 2020 at the earliest.
- In the longer term, growing merchant risk exposure in wind power projects will likely change the landscape and investor profiles in wind energy financing.

WIND ENERGY FINANCE BASICS

Debt and equity

The two main sources of capital in wind energy finance in Europe have been sponsor equity and debt. Sponsor equity refers to a traditional equity investor, typically the owner(s) of the project and/or the developer. Equity capital faces the highest risk in the project, because the owners are the party responsible for bringing the initial concept idea through development, construction and commercial operation. In addition, the owners are also the last investors to be liquidated in case of a project default. Because of the tough requirements that equity capital faces, the returns are also higher.

Debt refers to a contractually-arranged loan that must be repaid by the borrower. The lender has no ownership shares in the company or project. However, it has some collateral coverage as a financial protection in case the project is unable to meet the debt repayment schedule. In the case of project default, the lenders are the first party to be liquidated, before equity type investors. As such, debt is generally considered a lower-risk investment and therefore comes with lower-cost financing compared to equity.

There are two major types of debt in wind energy finance: construction debt and refinancing debt. Construction debt is raised for the purpose of financing new assets. Refinancing debt is raised for the purpose of financing construction debt at a longer maturity and/or lower interest rate.

Corporate finance and project finance

The proportion of debt and equity in a project, as well as the way they are utilised, will determine the capital or financial structure of the project. There are two types of financial structures: corporate finance and project finance. In a corporate finance structure, investments are carried on the balance sheet of the owners and project sponsors. Debt is raised at corporate level, with the lenders having recourse to all the assets of the company to liquidate a non-performing project. The project management and many of the contractual obligations are internalised with the owners and project sponsors. Corporate finance is therefore quicker and usually less expensive than project finance.

In a project finance structure, typically called non-recourse finance, the investment is carried off the balance sheet of the original owners and project sponsors. The investment or the project is turned into a separate business entity called a Special Purpose Vehicle (SPV) with its own management team and financial reporting, capable of raising debt on its own. Because debt is raised at project level, the lenders do not have recourse to the company assets of the owners

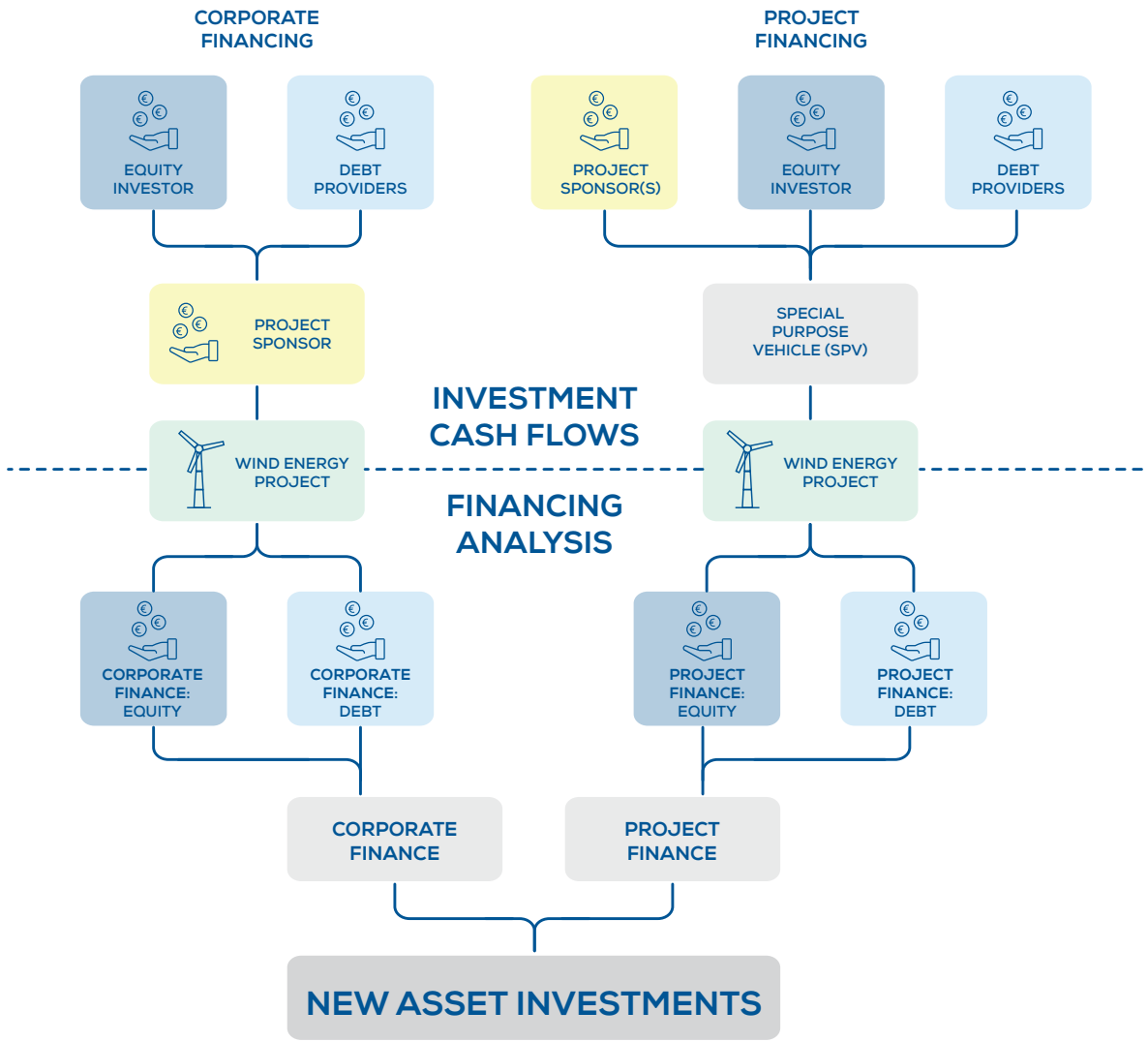
and project sponsors in cases of a project default. Due to increased contractual obligations and a more sophisticated risk management structure, project finance can be more expensive and lengthier to finalise than corporate finance.

Debt-to-equity ratios in a project finance transaction may vary considerably depending on the project specifics, availability of capital and risk profile of the project owners. For wind projects they range between 70-80% debt and 20-30% equity.

A company's capital structure will be determined by its particular risk profile, size and industry sector. Power producers and utilities with a large balance sheet will opt for a corporate finance structure and bring the project through construction as a single player. Fundraising will occur at corporate level through debt and equity vehicles alike.

Unlike utilities, independent power producers with smaller balance sheets and those companies whose primary business is not wind energy have better project finance capabilities. In a project finance structure, partnerships are key from a very early stage. Fundraising will occur at project level, through debt and equity vehicles alike. Project owners will need to form consortia to provide the required equity whereas lenders will come together to provide syndicated project loans on the debt side.

FIGURE
Corporate Finance vs. Project Finance



Source: WindEurope

Raising debt and equity

The project owners and sponsors can raise capital for project development from different sources. These may include own-balance sheet financing, external private investors, funding from commercial banks and public capital markets. The latter in particular has become more prominent for raising both debt and equity in wind energy financing.

Debt is usually raised through the issuance of bonds either at corporate or project level. Where a bond is issued at corporate level, the proceedings go for the financing of a portfolio of projects. The bond can carry the "green" label when the portfolio of projects it is financing is made exclusively of renewable energy investments. Where the bond is issued at project level, the proceedings are used for the specific renewable energy project and are therefore "green". Project bonds are issued on behalf of the SPV and are usually part of a non-recourse, project finance structure.

A bond is considered investment grade if its credit rating is a minimum of BBB- by Standard & Poor's or a minimum of Baa3 by Moody's. Investment grade bonds are considered by rating agencies as likely to meet payment obligations for investors.

Capital availability for wind power projects

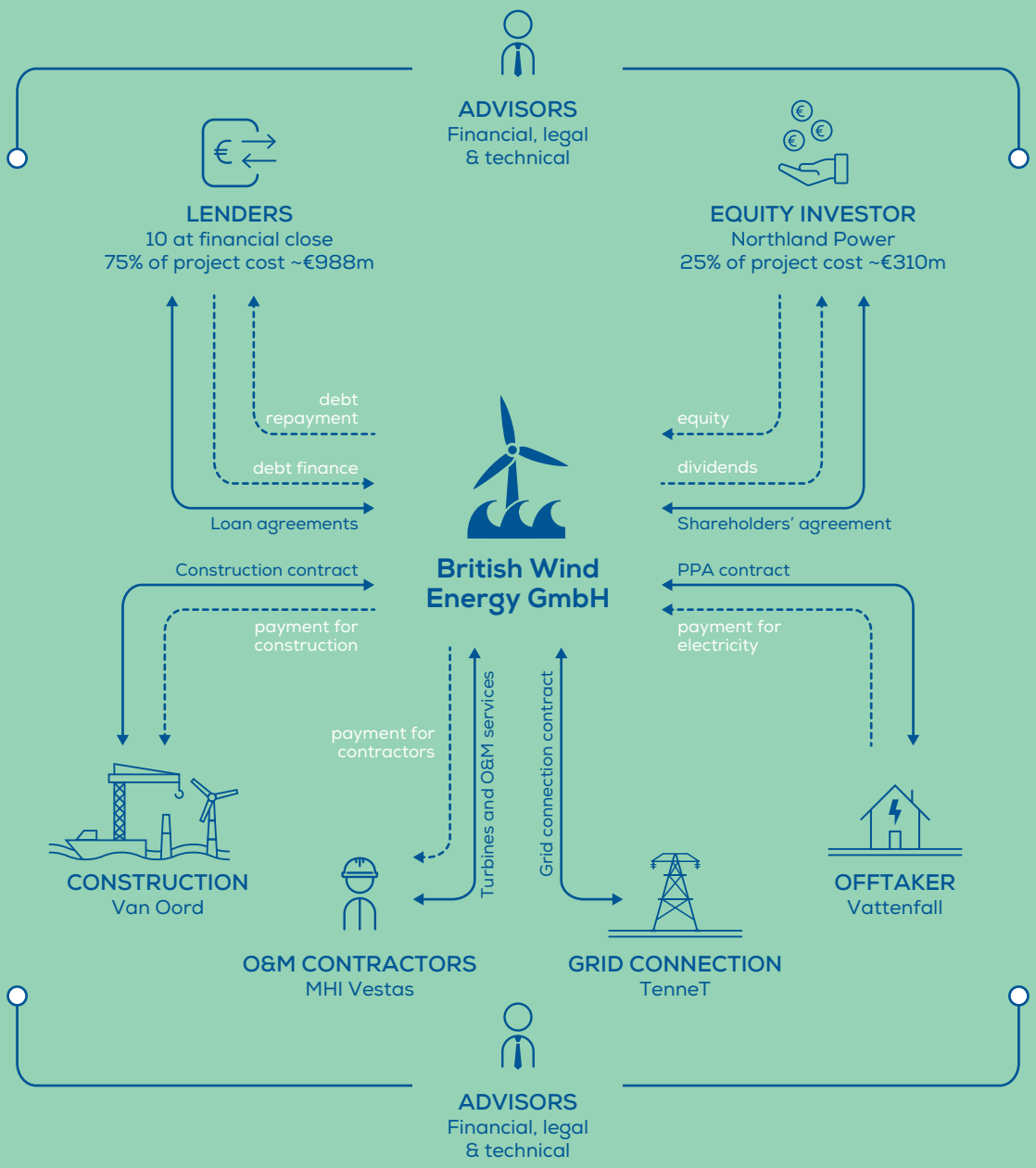
The financial markets have supported the growth of the wind sector with a strong liquidity on both debt and equity. The financing conditions of low interest rates, cost improvements and further trust gained in the technology have all contributed to a healthy deal flow of projects.

Debt liquidity has been available from construction phase with new financing and refinancing transactions in major markets. Lenders include a variety of bank and non-bank institutions such as Export Credit Agencies (ECAs). Multilateral Development Banks (MDBs) and other International Financial Institutions (IFIs) have also provided debt liquidity where commercial bank financing has not been available. International banks have also strengthened their presence in the European wind sector and introduced more competition to the sector. Japanese banks, driven by a prolonged low interest rate environment in their domestic market, feature predominantly in the top lending institutions for European wind power projects.

On the equity side, institutional investors are also bidding more aggressively for wind assets. Interest in the technology has picked up significantly from both institutional and strategic investors who are now looking at wind projects for steady, predictable returns to meet long-dated liabilities. Much like with the banks, investor appetite for the technology applies to both greenfield and existing assets. However, as confidence grows in the sector and a positive track record continues, investors are also targeting more greenfield projects earlier in the construction phase.

EXAMPLE OF FINANCING STRUCTURE FOR TYPICAL **OFFSHORE WIND PROJECT**

252 MW | 31 Turbines | €1.3 bn

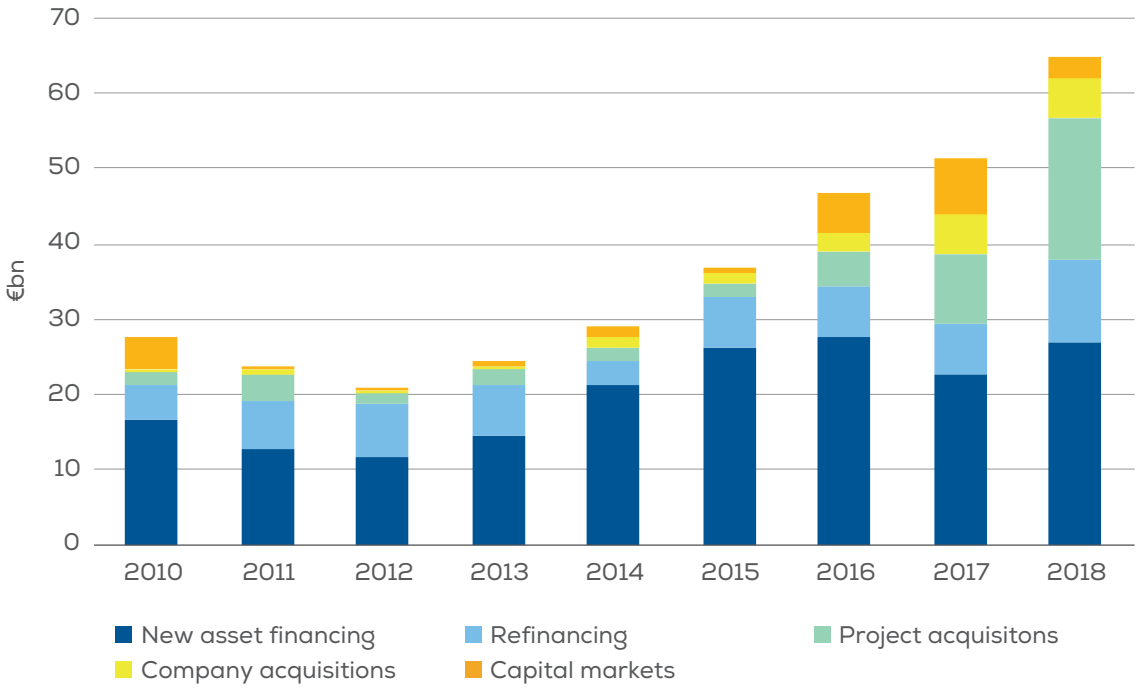


Source: Green Giraffe

1. INVESTMENT NUMBERS IN 2018

1.1 WIND ENERGY INVESTMENTS

FIGURE 2
Total wind energy investments in Europe 2010 – 2018 (€bn)



Source: WindEurope

Wind energy saw €65bn in financing activity in 2018. This represents a 26% increase from 2017. The biggest category within wind energy investments is new asset financing. In 2018, new asset financing for wind power projects stood at €26.7bn, a 20% increase on 2017. Although the amount invested in new assets in 2018 was similar to 2015 and 2016, the volume of new capacity financed was significantly greater as a result of cost reductions and sector maturity, particular in offshore wind.

Project acquisitions, where investors purchase (a share of) a wind energy project, were the main drivers for the overall growth in wind energy investments providing €18.9bn in investment activity. This compares to €9.1bn in 2017 and €4.3bn in 2016, demonstrating the strong growth in this area.

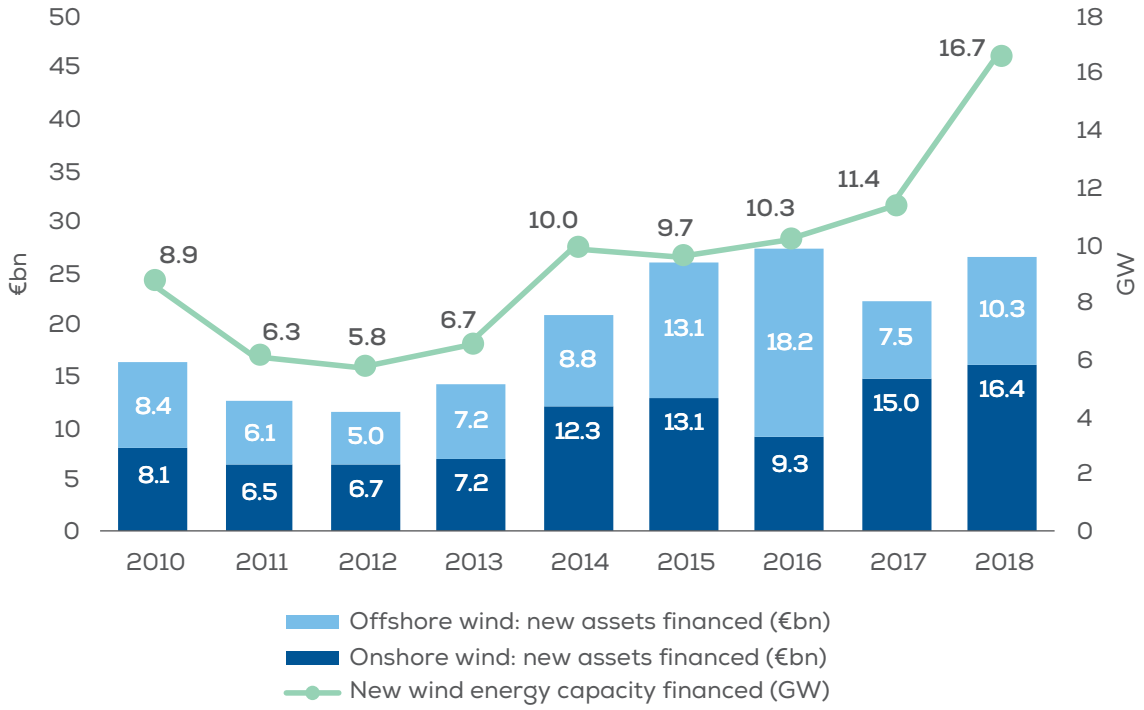
With €5.2bn, company acquisition deals were similar in value to 2017, continuing the consolidation phase the wind energy industry has experienced in the last years across the supply chain. Sector maturity and technology competitiveness have brought in more investors as equity partners in projects, in particular from the financial services industry. These partnerships are key for power producers and developers who need to recycle capital to finance new assets.

Companies continue to make use of the low interest rate environment and liquidity in the financial markets by raising debt and equity via capital markets. However in 2018 companies in the wind energy sector only raised €3bn in public capital markets – less than half the amount raised in 2017.

1.2 NEW ASSET FINANCE PER COUNTRY

FIGURE 3

New asset finance in wind energy 2010 – 2018 (GW and €bn)

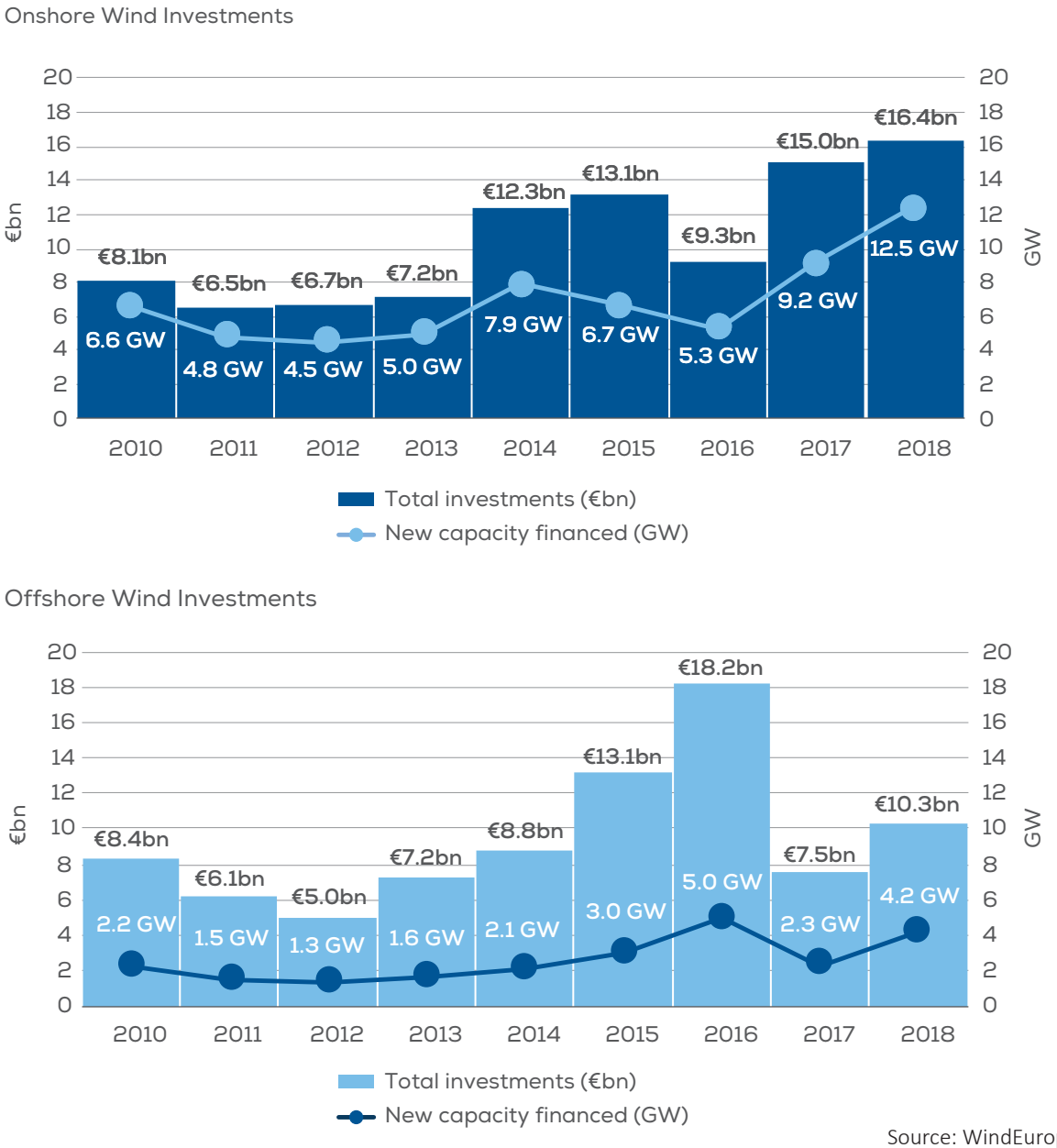


Source: WindEurope

2018 was another record year for new capacity financed. 16.7 GW of new capacity, 45% more than in 2017, reached Final Investment Decision (FID) in Europe. This was spread across 190 projects in 22 countries. Both onshore and offshore wind projects drove the growth, seeing record amounts in new capacity financed.

In monetary terms, investments in new wind energy projects were also up, by 20%, to €26.7bn. Sector maturity and competitive auctions for new renewable energy capacity have resulted in cost reductions across the wind industry's value chain, allowing more new capacity to be financed per euro of capital investment.

FIGURE 4
New asset finance in wind energy per technology, 2010 – 2018 (€bn)



Source: WindEurope

Onshore wind saw a record year for investment in new projects reaching FID. This continued an overall trend of increasing investment since 2011. Capital expenditure per MW for new onshore assets has been falling since 2015, albeit not as quickly as in offshore. 2018 saw a record amount of new capacity financed in onshore wind.

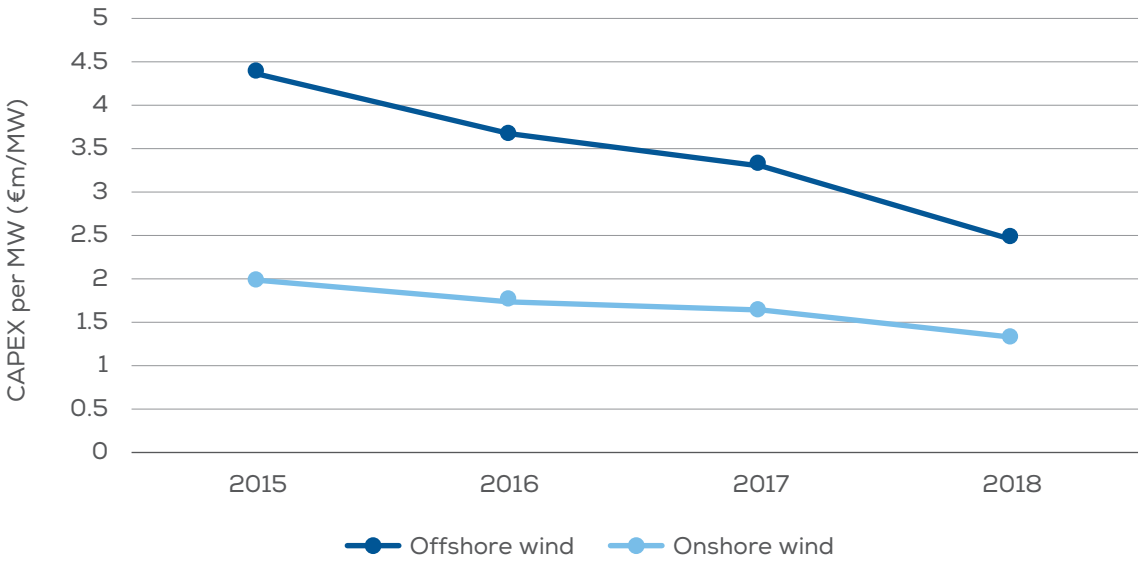
In **offshore wind**, investments in new projects increased by 37% from 2017 to €10.3bn. This is still some way off the record €18.2bn seen in 2016. We saw a peak in 2016 followed by a lull in FIDs in 2017. However, since offshore wind projects are fewer and generally larger than onshore, investment statistics can be volatile and therefore emerging trends should be treated with a degree of caution.

With 4.2 GW of new offshore wind projects reaching FID, 2018 saw the second highest capacity financed after 2016. In other words, for both offshore and onshore wind projects, we continue to get more for our money.

Of the €16.4bn investment in new projects, €5.1bn were in **non-EU countries**: Russia, Turkey, Ukraine, Norway and Serbia. This is over four times more than 2016 and 76% more than 2017, demonstrating both strong growth and growth potential in this market. Russia led the investment in the non-EU countries with €1.6bn, followed by Ukraine with €1.2bn and Norway at €0.8bn. Capital expenditure for these countries averaged €1.4m per MW financed, only slightly more than EU countries which averaged €1.3m per MW.

FIGURE 5

Capital expenditure per MW financed in wind energy, 2015 – 2018 (€m/MW)

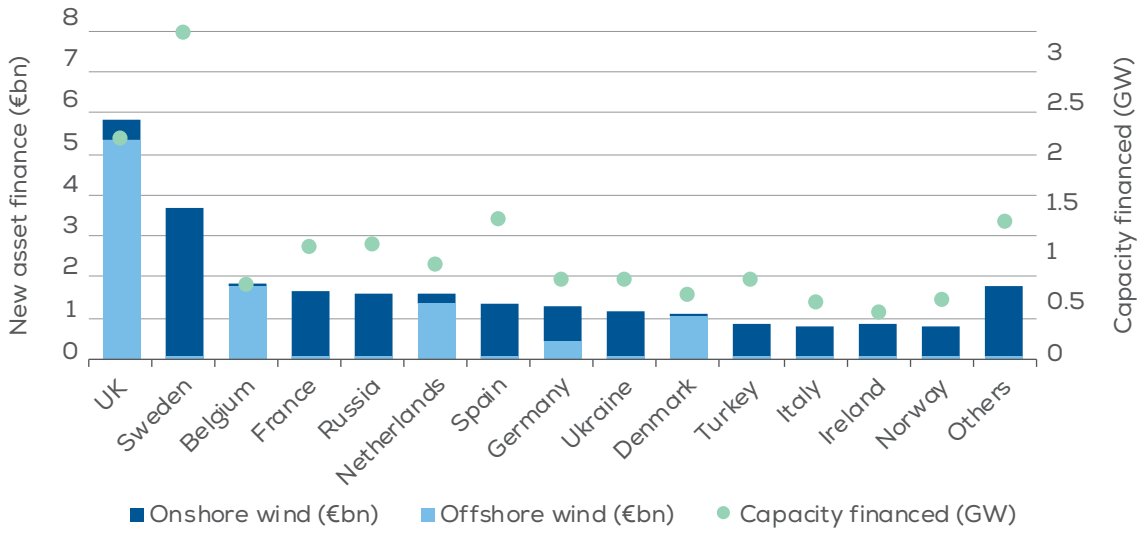


Source: WindEurope

Capital expenditure (CAPEX) raised (per MW of capacity) for new wind energy projects has been steadily falling in recent years. In 2015, onshore wind required an average €2m of financing for each MW of capacity installed. By 2018 this had reduced to €1.4m per MW, a reduction of 43%. Offshore wind being a less mature technology, has seen a more dramatic decrease in CAPEX per MW over the same period: from almost €4.5m per MW in 2015 to just under €2.5m per MW financed on average in 2018. This represents a reduction of 45% in capital expenditure per MW over just four years.

FIGURE 6

New asset finance in wind energy per country, 2018 (€bn and GW)



Source: WindEurope

Wind energy investments in 2018 continued the trend of geographical diversification. The top three investor countries owned 43% of FID announcements in 2018, compared with 64% in 2017 and 73% in 2016. However, different European wind energy markets are maturing at different rates and there has been an unhealthy concentration of new installations in recent years. There continues to be a significant number of countries in Europe which are not attracting investment and have no new installations.

Northern and Western Europe still holds the bulk of new investments. The UK was the biggest investor in 2018 with over 90% of its investments in the offshore wind sector. In total, the UK financed €5.9bn of wind investments, representing 22% of total financing activity for the construction of new onshore and offshore wind farms. Sweden was the second biggest overall investor and the leading onshore wind investor with €3.7bn investments in 2018.

A number of particularly large offshore windfarms in North Western Europe reached FID in 2018. Moray East (950 MW), Triton Knoll (850 MW) and Borssele III & IV (732 MW) were notable not just for being some of the largest wind farms to date but because the leverage of the financing was particularly high compared with previous projects. With at least 88% debt financing, these wind farms used a significant pool of non-recourse debt from 32 banks to finance the projects. The size of the investments needed for FID and the current attractiveness of the debt financing market contribute to this trend.

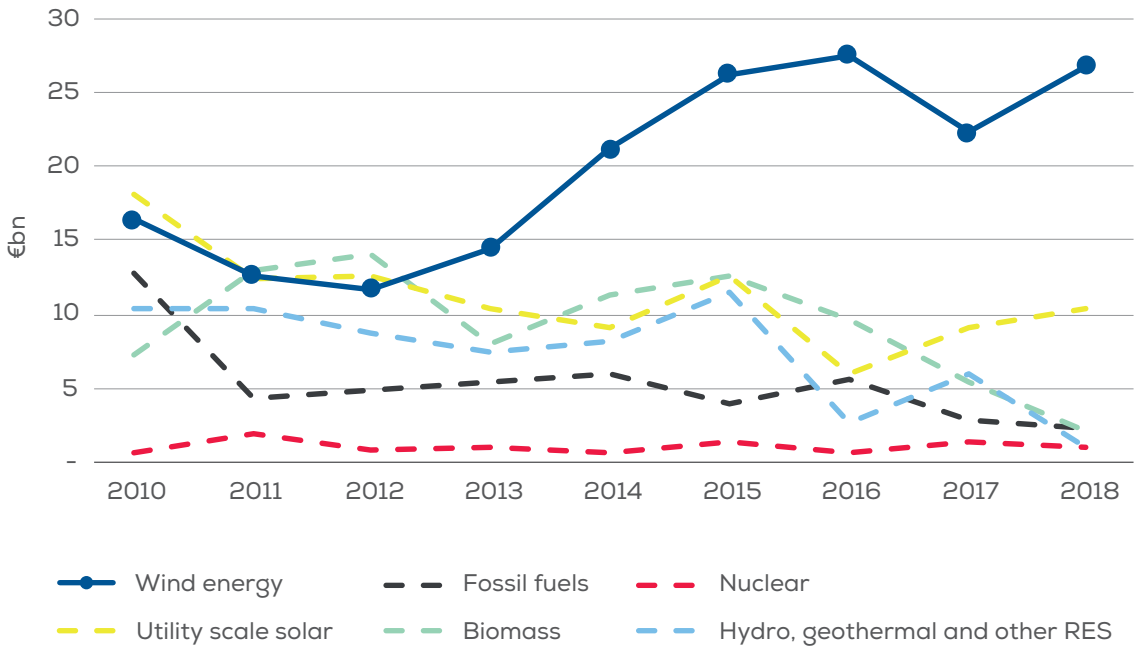
Investments in South East Europe (SEE) remain low. Investor confidence has been slow in recovering mainly due to macroeconomic and political factors. With a total of €1.0bn, the SEE region represents only 4% of the total new assets financed in Europe.

However, other markets are picking up. Following the auctions in recent years, Spain is starting to attract investors and saw the third highest amount of capacity financed in 2018, with 1.4 GW in onshore and offshore wind.

In many important EU markets there are currently no wind investments, despite these countries having significant potential for further expansion of wind power. National energy policies and lack of a stable regulatory environment have affected both the level of investment and financial commitments in half of EU Member States. Closely tied to policy and regulatory stability is the cost of capital. Future political uncertainty is factored in as a risk premium. Higher risks lead to a higher cost of capital and negative impacts on the economic viability of wind projects in these countries.

FIGURE 7

Investments in new power capacity in Europe, 2010 – 2018 (€bn)



Source: WindEurope

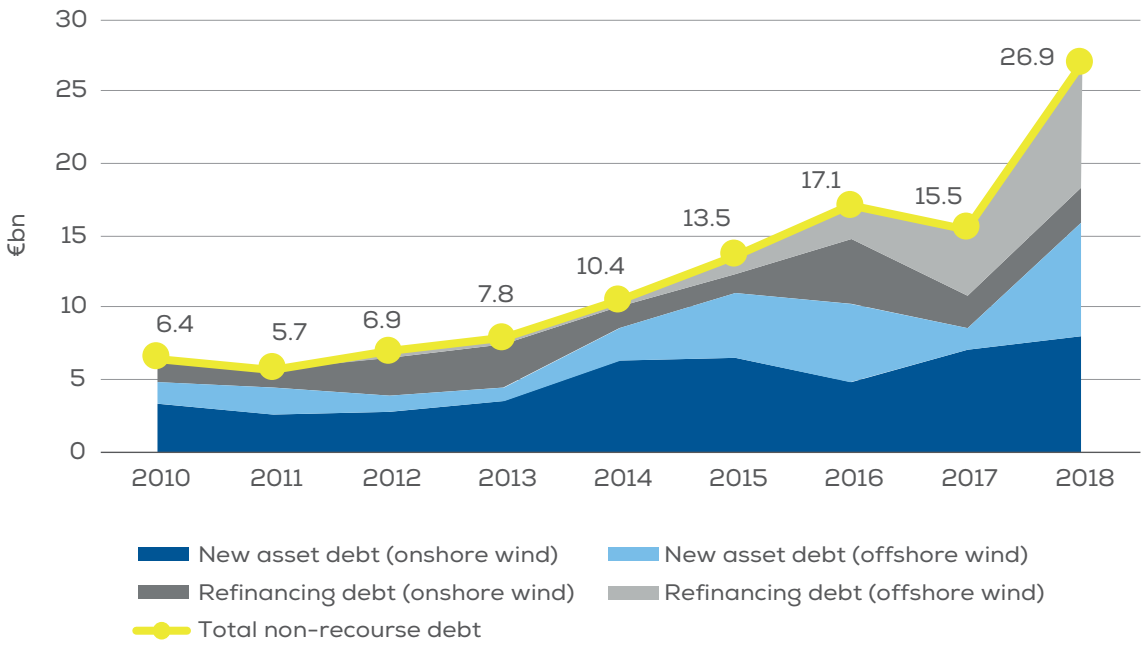
In 2018 wind energy represented over 60% of the renewable energy investments in new power generation capacity. Onshore wind alone accounted for 38% of the market. Overall, investments in new wind power generation capacity have been steadily increasing in the last five years at a compound annual growth rate (CAGR) of 13%.

In our analysis we have included only investment in new power generation capacity and not in energy infrastructure. There were a number of fossil fuel infrastructure projects financed in 2018, for example the Trans Adriatic Pipeline (€3.6bn), the Trans-Anatolian Natural Gas Pipeline (€0.6bn) and the Gas to the West Pipeline (€0.4bn).

2. SOURCES OF FINANCE IN 2018

2.1 DEBT FINANCING

FIGURE 8
Non-recourse debt financing : new assets and refinancing, 2010 – 2018 (€bn)



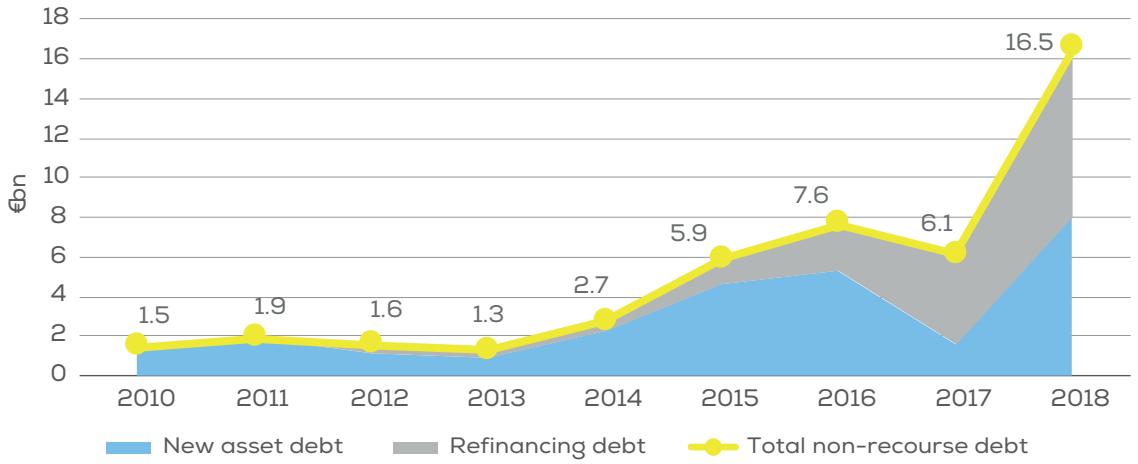
Source: WindEurope

There has been steady growth in debt financing since 2011. Emerging new business and ownership models have diversified the pool of investors in wind energy and unlocked the potential for long term sources of finance from banks, institutional lenders and Export Credit Agencies (ECAs). This has led to a significant amount of affordable debt, in particular in the form of non-recourse financing.

In 2018 €26.9bn in non-recourse debt was raised: €15.9bn for the construction of new projects and €11.0bn for the refinancing activities of wind farms. Both these figures represent record amounts to be raised in a year.

FIGURE 9

Non-recourse debt financing in offshore wind projects 2010 – 2018 (€bn)

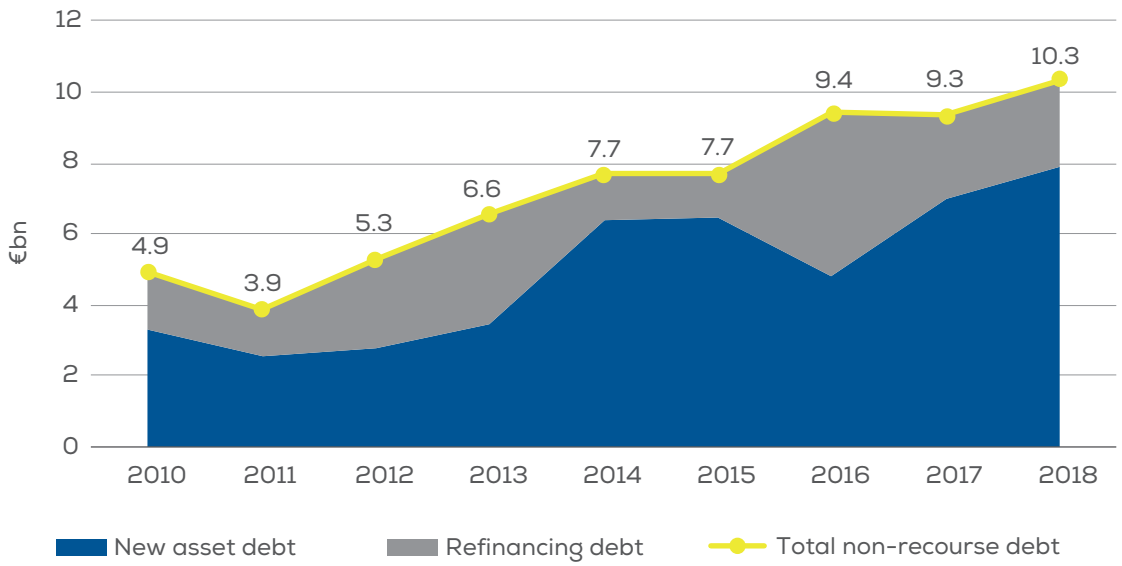


Source: WindEurope

The overall growth in non-recourse debt has been driven by the offshore market, which has seen €16.5bn financed in 2018, more than double that of the previous high in 2016. Debt financing conditions continue to be favourable with low interest rates and plenty of lenders and, as the market matures, developers are taking advantage in order to refinance their loans. This has seen the refinancing of offshore wind projects develop to an €8.5bn market in 4 years.

FIGURE 10

Non-recourse debt financing in onshore wind projects 2010 – 2018 (€bn)

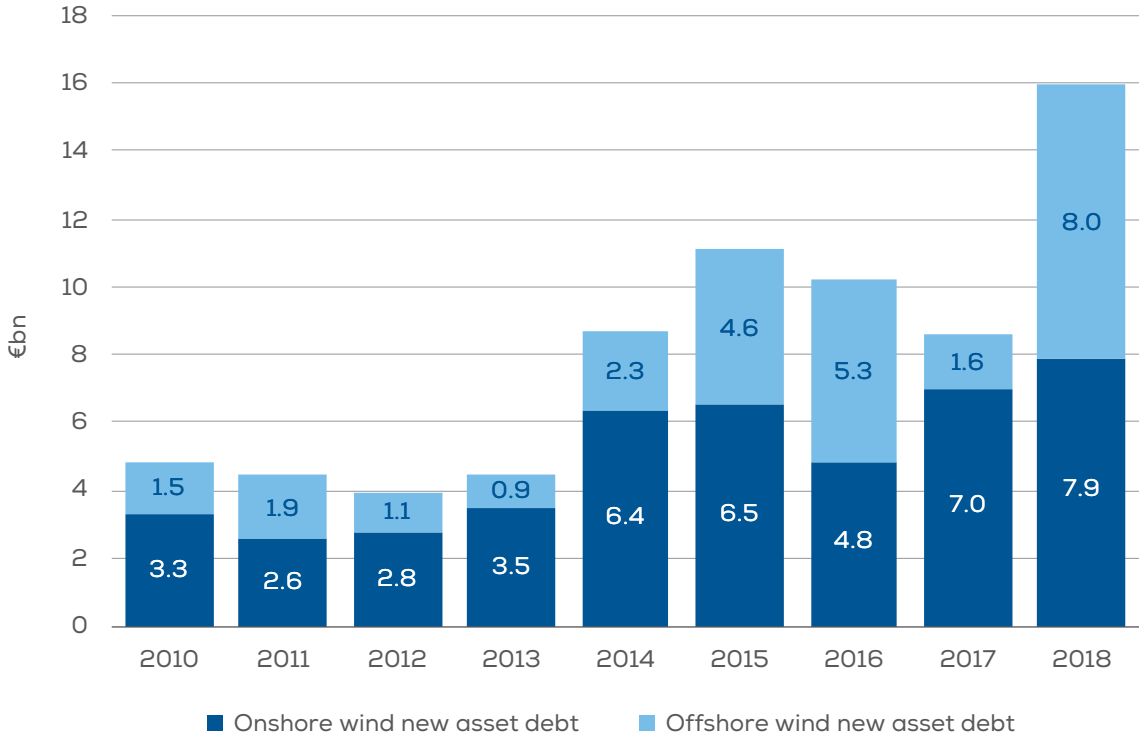


Source: WindEurope

The market for non-recourse debt in onshore wind energy projects in Europe has seen steady growth since 2011, increasing at a compound annual growth rate of 15%.

FIGURE 11

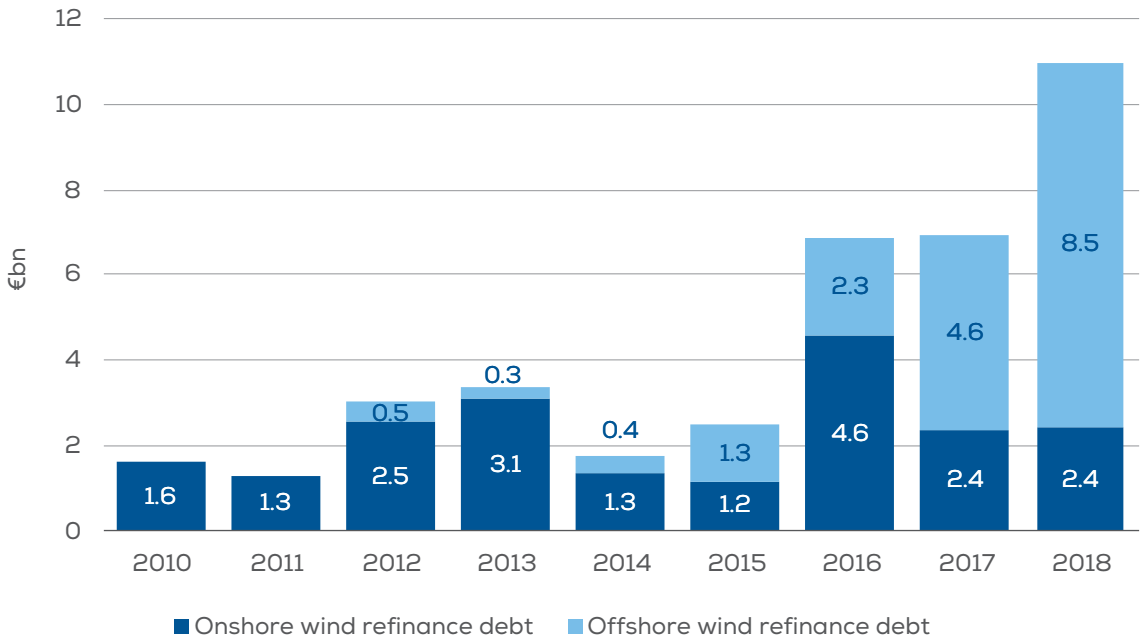
New asset non-recourse debt per technology 2010 – 2018



Source: WindEurope

Non-recourse finance has traditionally been the predominant model for onshore wind but 2018 saw an equal share with offshore wind. Non-recourse debt leveraged 60% of all the new capital expenditure requirements and debt raised for new offshore wind farms recovered from the 2017 low of €1.6bn to €8.0bn. This represented 77% of all financing for new offshore assets, a significant increase on previous years which had seen a trend in the uptake of corporate finance.

FIGURE 12
Non-recourse refinancing debt per technology, 2010 – 2018 (€bn)



Source: WindEurope

The trend in increasing refinancing activity has been driven by huge growth in the offshore refinancing market. Of the €11bn in non-recourse debt raised for refinancing activities, €8.5bn was for offshore wind projects and €2.5bn for onshore wind.

Offshore wind refinancing was dominated by 4 projects which have restructured their loans on the completion of construction and commissioning of the wind farms. These were: Galloper (€1.6bn), Dudgeon (€1.5bn), Race Bank (€1.5bn) and the Veja Mate offshore wind farms (€1.1bn).

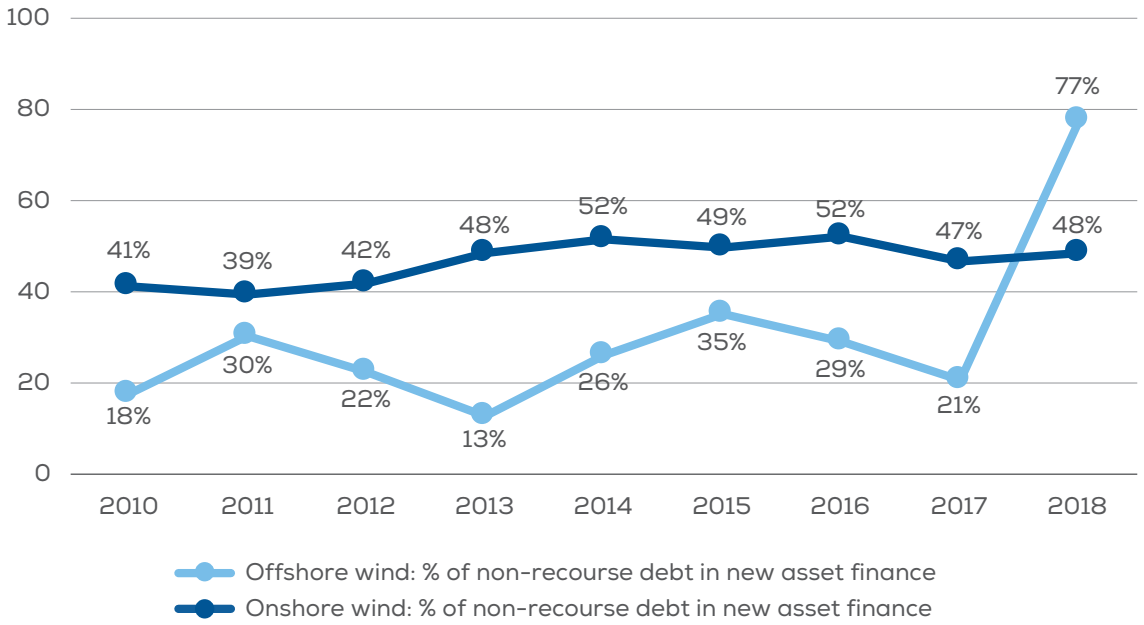
The current financing conditions of low interest rates have contributed to this trend. Developers are restructuring old debts for more favourable terms, be it for price or loan duration. However, part of the rising refinancing trend also stems from changes in the way these projects are financed.

Competitive pressures driven by the surge in auctions have altered the financial arrangements in wind energy investments. Opting for a corporate finance structure where you internalise the project's management allows power producers to raise cheaper debt at corporate level during construction phase, and therefore lower the cost of finance. However, a number of large offshore projects that reached FID in 2018 were financed by significant lending on a project finance basis. Developers have been able to take advantage of the competitive lending market and finance their projects with cheap debt. This has allowed smaller developers to finance large offshore projects, an area which has typically been dominated by a few of the largest developers with the resources to fund large projects on their balance sheets (i.e. with corporate finance).

The growing confidence and demand for wind energy assets has made it easier for power producers and developers to exit their projects and sell them on to different investors who then use project finance to purchase their ownership share. Power producers know at a very early stage when and to whom part of the project is going to be disposed.

FIGURE 13

Percentage of non-recourse debt in new asset finance, 2010 - 2018



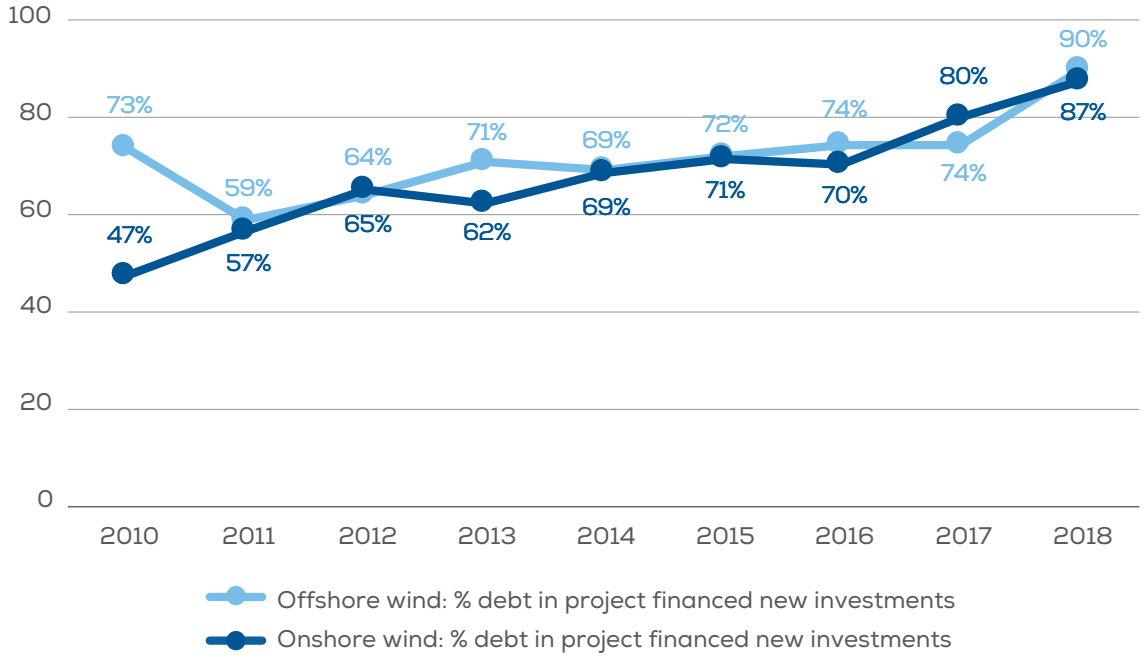
Source: WindEurope

Project finance debt has consistently been around half of all capital raised for new onshore wind projects. For offshore wind projects, the proportion of non-recourse debt has typically been lower than onshore but in 2018 this trend was reversed and 77% of all capital raised for offshore wind farms reaching FID was in the form of non-recourse (project finance) debt. This was dominated by a few large wind farms with very high debt leverages raised on a project finance basis.

Banks are more comfortable with the risks associated with the offshore market facilitating the take up of new offshore projects on a project finance or non-recourse basis.

FIGURE 14

Share of debt in project financed new assets 2010 – 2018

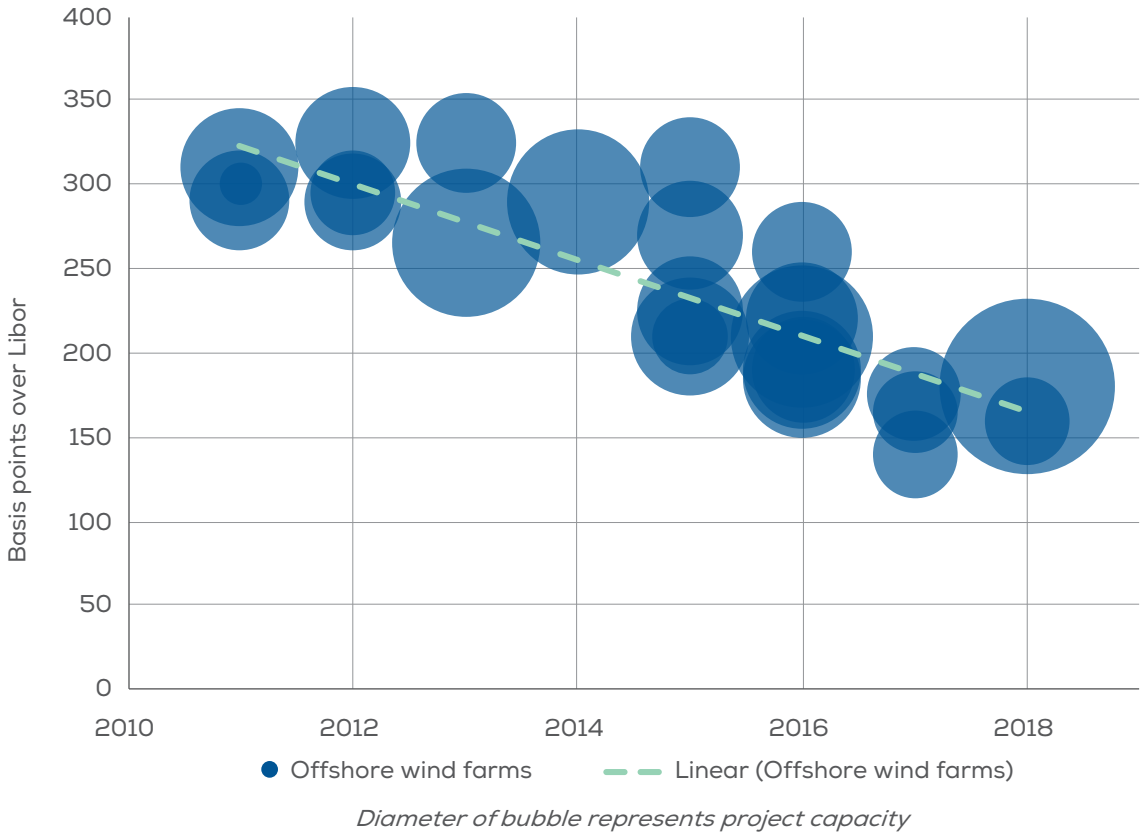


Source: WindEurope

Over the years, there has been a distinct trend of increasing leverage in both onshore and offshore investments on a project finance basis. A host of lenders offering attractive terms and favourable conditions have impacted the optimum amount of debt raised for projects, with leverage in 2018 around 90%.

FIGURE 15

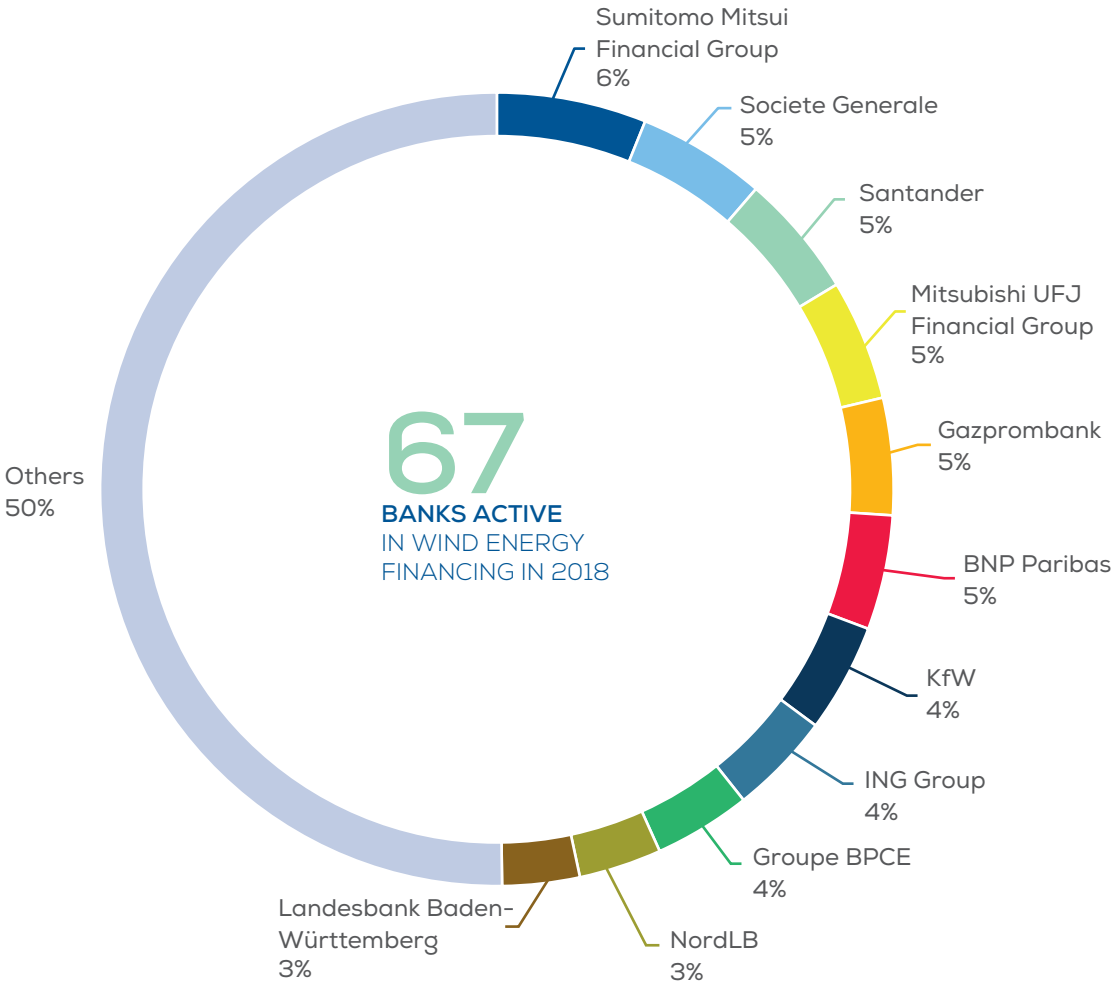
Interest rates: basis points per MW financed 2010 – 2018 (size of the bubble represents project capacity)



Source: Green Giraffe, WindEurope

The debt markets have supported construction activity on attractive terms. Transactions in 2018 continued to reflect the general trend of easing loan terms when it comes to pricing, maturity and tranche. The low interest rate environment has provided wind energy projects with competitive financing and lower financing costs. Larger projects are now able to fundraise under more favourable market conditions. The risk premium charged by lenders has been consistently falling as the offshore wind market matures and lenders become more comfortable with the risks.

FIGURE 16
Market share of banks active in wind energy financing in 2018



Source: WindEurope

Over 67 lenders were active in 2018, including multilateral financial institutions, export credit agencies and commercial banks. As confidence grows in the European wind sector, international banks continue to strengthen their presence in the market.

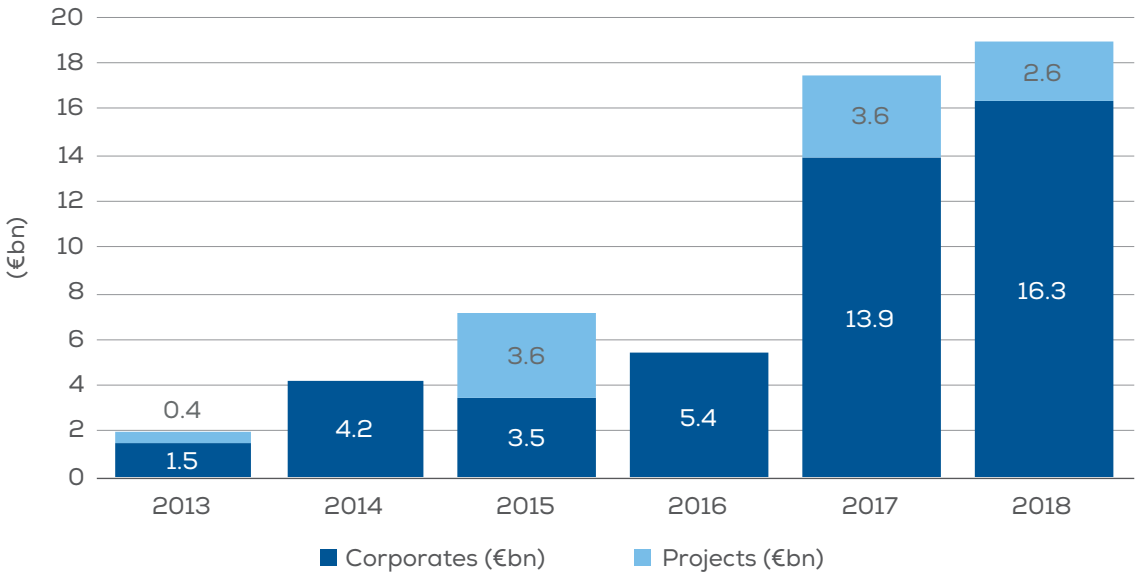
2.2 GREEN BOND ISSUANCES

Bond issuances[1] have been an important part of debt financing for wind energy projects, however only a fraction of the €18.9bn of new issuances in 2018 were exclusively raised for wind energy projects (€2.7bn). Green bonds have seen strong growth since 2013 and 2018 was another record for new issuances. The funds raised from these issuances serves to finance renewable energy portfolios, including wind power projects and offshore transmission lines.

The majority of these issuances (86%), a total of €16.3bn, came from corporate bonds. Amongst the top issuers are Iberdrola with €5.5bn, Enel with €3.4bn, TenneT with €1.5bn and Innogy with €1.1bn.

Despite a slowdown in 2018, project bonds have emerged as alternative sources of debt. To date, project bond issues have mainly been in offshore wind and transmission lines. For onshore wind to access this market, projects will need to be aggregated in larger portfolios.

FIGURE 17
Green bond issuances 2013 – 2018 (€bn)[2]

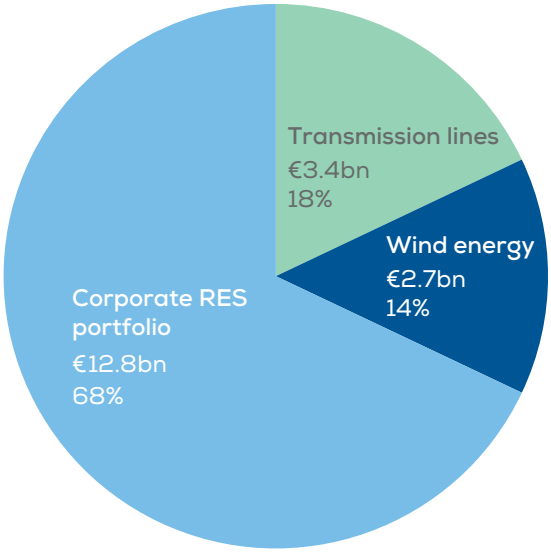


Source: WindEurope

1. The analysis shown excludes sovereign bonds.
2. Figures pre 2018 include unallocated green bonds categorised under "Others".

FIGURE 18
Green bond issuances in 2018 by technology

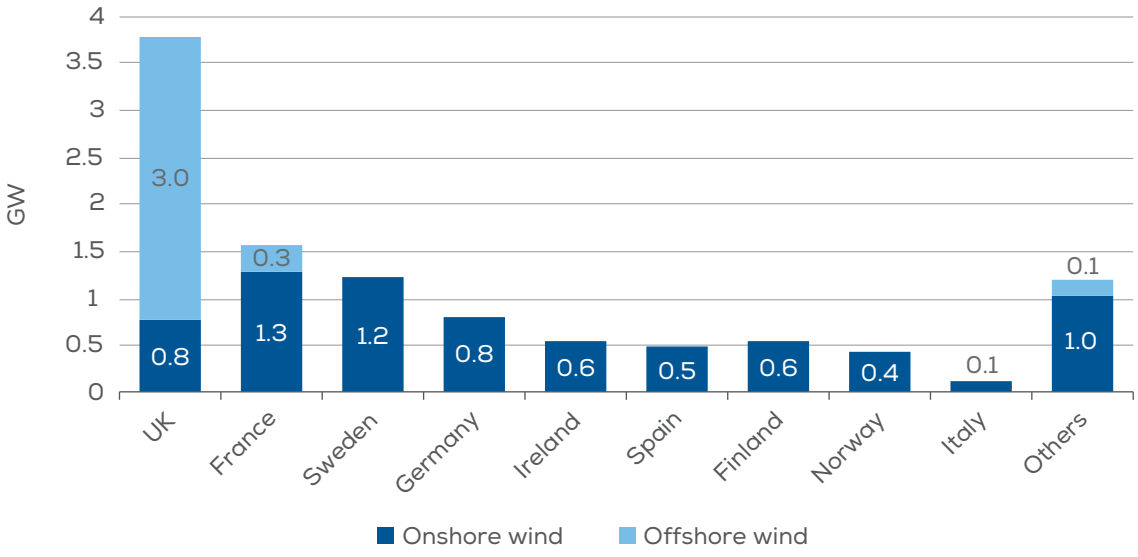
Just 14% of all the green bond issuances in 2018 came from companies exclusively operating in the wind industry, either through project or corporate bonds (for those companies operating uniquely in the wind energy sector). Corporate RES portfolio refers to renewable energy portfolios which include wind energy but are not exclusively wind-based.



Source: WindEurope

2.3 PROJECT ACQUISITIONS

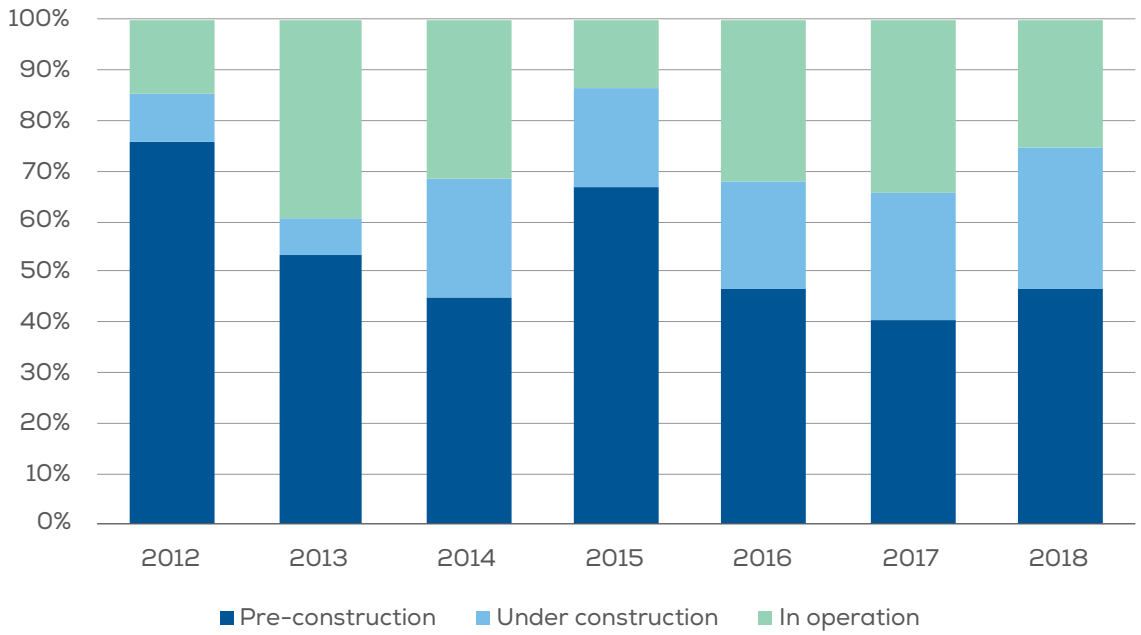
FIGURE 19
2018 project acquisitions by country (GW)



Source: WindEurope

Project acquisition activity in 2018 stood at 11.1 GW of capacity traded, an 18% increase on 2017. 3.5 GW of acquisition activity was in offshore wind and the remaining 7.6 GW in onshore wind. The UK was the largest secondary market, followed by France and Sweden. The combined activity in the three countries accounted for 62% of all the wind power capacity traded at the development, construction and operational phase.

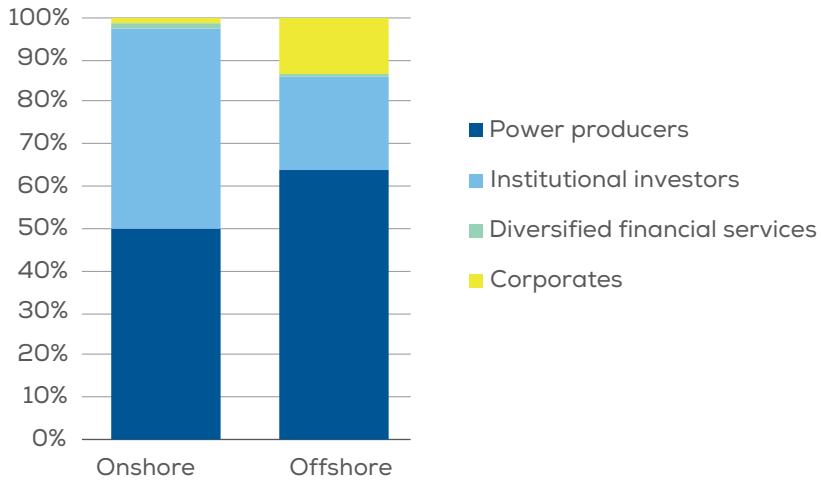
FIGURE 20
Project acquisition activity by project phase (GW, %)



Source: WindEurope

Transactions continue to be most common at the pre-construction stage. However, there has been a steady increase in demand for assets under construction and this accounted for over 30% of acquisitions in 2018. As confidence grows in the wind energy sector, institutional investors and the financial services industry are more willing to invest in these projects at construction phase, long before they become operational. Investors are targeting earlier stages in wind farm development, seeking higher returns associated with the extra risk and/or a share of the market.

FIGURE 21
Project acquisition activity by type of investor in 2018 (GW, %)



Source: WindEurope

The onshore acquisition market was dominated by power producers and institutional investors in 2018, with only 5% from corporates and diversified financial services (banks and insurance firms). The different scales and technology risk profiles of onshore and offshore wind attract different types of investors.

Both Japanese trading houses and major industrial retailers (looking for infrastructure investments as an asset class) are more present in offshore wind projects. 2018 saw large corporations such as the Sumitomo Corporation and China Resource Holdings Company acquiring stakes in offshore wind projects.

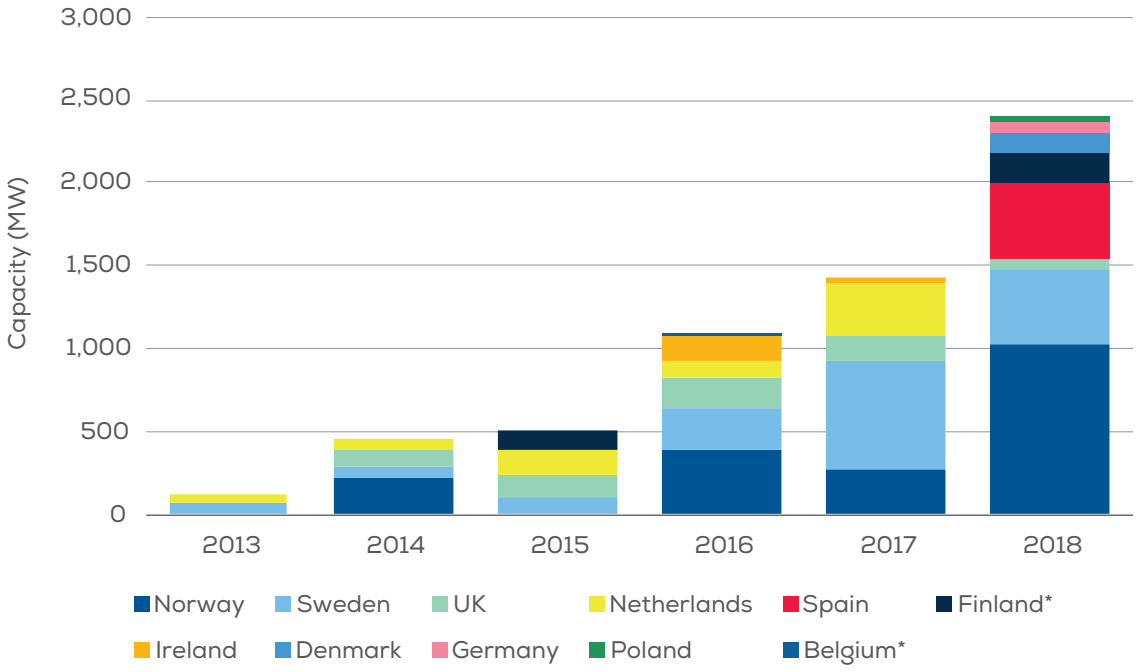
Corporates looking for clean energy to power their facilities will more likely invest in onshore wind farms. Cost-competitiveness, location and the proximity of the wind farm to their facilities are the main drivers for these investments.

2.4 CORPORATE RENEWABLE POWER PURCHASE AGREEMENTS (PPAs)

2018 was a record year for corporate renewable PPAs deals in Europe with 2.4 GW of contracted capacity in wind and solar power projects. Recent years have seen a steady growth in corporate renewable PPA deals in Europe. The volume of capacity contracted through corporate PPAs has increased fivefold since 2015, from just 1 GW in 2015 to over 6 GW in 2018. Over 85% of the contracted renewable capacity in the last five years has been provided by wind power projects.

Wind energy is very well placed among other low carbon technologies to accommodate corporates' needs for renewable electricity due to its scale, cost-competitiveness and risk profile.

FIGURE 22
Renewable energy corporate sourcing through power purchase agreements (MW)[3]



Source: WindEurope

3. There have been two cross border PPAs between Netherlands – Belgium and Finland – Belgium.

There are different models of corporate engagement. The most important that have been used in wind energy can be broadly summarised in two segments: investing directly in projects and owning the underlying asset, or acting as an off-taker through power purchase agreements (PPAs).

From a corporate's perspective, acting as an off-taker is a feasible model to control costs over long periods of time (at times up to 20 years), diversify energy sources and meet sustainability targets. Owning the asset may come with certain cost of capital implications for corporates. This is not only due to the large pay-back period for wind energy projects, but also due to increasing competition for ownership in wind energy assets. Corporates not operating in the wind sector might find it challenging to execute renewable contracts at better prices when compared to power producers or other businesses with more experience.

Corporate renewable PPAs also come with certain benefits for generators. Price visibility over a long period of time and a guaranteed off-taker are important to lower the cost of debt financing. Lenders would typically need downside protection in project revenues to ensure debt repayment obligations are met. As such, they tend to prefer lower revenues over a long period of time – matching the loan term, rather than higher but uncertain revenues.

Corporate renewable PPAs to date are still limited to a handful of countries although 2018 saw the first corporate PPAs signed in four countries: Poland, Germany, Denmark and Spain. The Nordic region, followed by the UK and the Netherlands, are the biggest market for such deals. What these markets have in common is a good track record in renewable energy development, coupled electricity markets, sufficient demand for green electricity from corporates and – most importantly – a lack of explicit regulatory barriers to sign corporate renewable PPAs. However, the new Renewable Energy Directive mandates Member States to identify and remove administrative to corporate PPAs and facilitate their uptake in their National Energy and Climate Plans which set out their Climate & Energy policies from 2021 to 2030.

One important element in corporate PPAs is the underlying renewable energy support scheme in the country. In Feed-in Tariff jurisdictions, for instance, it has been challenging to find the value proposition for such contracts. Therefore, as the Feed-in Tariff support schemes across European countries are brought to an end, market-driven markets will likely see the volume of corporate renewable PPAs increase in the near future. Elements of merchant financing that are starting to emerge in the wind sector will require some form of additional revenue stabilisation through support schemes, corporate renewable PPAs and other hedging instruments.

3. INVESTMENT OUTLOOK

The previous two years were transitional years for the wind sector. There was uncertainty due to the transition to auctions from administratively set tariffs. However, projects awarded support with the roll-out of auctions across Europe are now reaching FID.

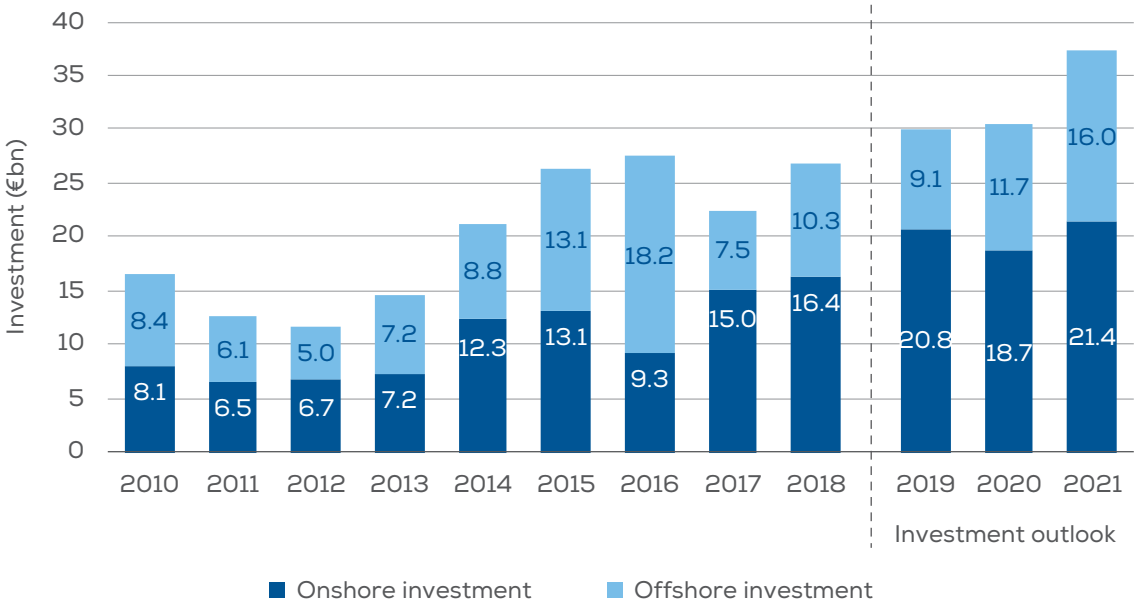
Over 9 GW of capacity was awarded support through renewable energy auctions in 2018: 4 GW in Germany, 2.1 GW in Turkey, 1 GW in Poland, 800 MW in both the Netherlands and Russia and over 300 MW in Greece[4]. The majority of the auctioned capacity was in onshore wind. Some of these projects have already reached FID.

According to our projected wind installations[5], and using an average CAPEX per MW for new onshore and offshore wind projects, financing needs could approach €98bn (including projects awarded support in 2018 yet to reach FID) between 2019 and 2021. This would represent approximately 53 GW of new wind energy capacity.

Between 2019 and 2021, around 46 GW of additional onshore and offshore capacity (including wind specific and technology neutral auctions in which wind projects can bid[6]) is set in the auctioning plans of Member States.

4. Detailed auction schedule is available at windeurope.org, members' portal.
5. WindEurope Market outlook to 2022, September 2018 (available only for members at windeurope.org).For onshore we consider FID to take place 1 year before installation; we assume 2 years for offshore.
6. More information can be found at windeurope.org/tenders (available only for members).

FIGURE 23
Investment outlook to 2021 (€bn)



Source: WindEurope

Financial markets will continue to support wind energy projects with similar loan pricing, maturity and other commercial terms. The European Central Bank ceased its program of quantitative easing at the end of 2018 (as it was widely expected to). However, it announced that rates will remain unchanged throughout 2019 with its first post-crisis rate hike coming in 2020 at the earliest[7].

In the longer term, wind asset owners will have to address the merchant element in wind power projects. WindEurope expects that by 2030 more than 25% of the wind installed capacity will be fully exposed to market risk[8]. While banks are used to dealing with portions of merchant financing, equity institutional investors may find it challenging to adapt to the new reality. This underscores the importance of financing solutions that capture the nature of merchant risk and stabilise the revenue flows in these projects.

7. Reuters (March 2019).
8. WindEurope (2017), The value of hedging : New approaches to managing wind energy resource risk.

Photo: Keith Arkins

GLOSSARY

- **Asset finance:** includes all infrastructure investments in onshore and offshore wind farms, including refinancing transactions.
- **New asset finance:** includes all infrastructure investments in the construction of new onshore and offshore wind farms, excluding refinancing transactions.
- **Final Investment Decision (FID):** the final decision to go ahead with the project once the permitting and financial arrangements are in place.
- **Capital markets:** refers to activities that gather funds from the issuance of shares and bonds.
- **Venture capital and private equity (VC/PE):** refers to the provision of long-term equity financing to emerging companies as a direct investment.
- **Mergers and acquisitions:** includes company merges and acquisitions as well as the acquisition of interest in onshore and offshore wind projects.
- **Corporate finance / on – balance sheet financing:** includes all investments in wind power generating and transmission assets financed either through the equity of project owners or through debt raised at corporate level.
- **Project finance / off – balance sheet financing:** includes all investments in wind power generating and transmission assets where the project debt and equity used to finance the project are paid back from the cash flow generated by the project (as opposed to the balance sheet of project owners). To this end, projects are a spin-off as a separate entity.
- **Non-recourse debt:** debt raised in project finance transactions.
- **Syndicated loan:** a loan provided and structured by a group of lenders.
- **Green bond:** corporate bond, the proceedings of which will be used to finance a portfolio of renewable energy projects. Unless specified, the use of money is often unallocated.
- **South East Europe (SEE):** Geographical region of Europe including Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Kosovo, Macedonia, Romania, Serbia and Slovenia.
- **Project bond:** includes bonds issued at project level, the proceedings of which will be used to finance a specific project.
- **Initial Public Offering (IPO):** the very first sale of stock issued by a company.
- **Corporate renewable power purchase agreement (PPA):** a long term bilateral agreement for the purchase of power from a specific renewable energy project, where the power off-taker is a corporate as opposed to a power producer.
- **Weighted Average Cost of Capital (WACC):** The WACC is calculated as weighted average of the cost of debt (the interest rate charged by lenders), the cost of equity (compensation required by shareholders for bearing risk of ownership) and the cost of any other category of capital (preferred stock, long-term debt etc.). It represents the cost to a business of raising capital and is a measure used to assess whether to invest in a new project.
- **Merchant risk:** refers to the risk faced by asset developers and investors in renewable energy projects where revenues depend on market-based electricity prices, as opposed to subsidised fixed prices.

WindEurope is the voice of the wind industry, actively promoting wind power in Europe and worldwide. It has over 400 members with headquarters in more than 35 countries, including the leading wind turbine manufacturers, component suppliers, research institutes, national wind energy associations, developers, contractors, electricity providers, financial institutions, insurance companies and consultants. This combined strength makes WindEurope Europe's largest and most powerful wind energy network.

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